customers the kind of location and callback functionality that took the wireless community 16 years to develop and deploy.[1]

Based on a survey of signatory companies who provide a residential retail VoIP replacement phone service, 100% ensure that when 9-1-1 is dialed, it gets routed to a designated PSAP. Ahead of expectations, 50% of signators who provide a residential VoIP replacement phone service are already providing an E9-1-1 service comparable to traditional fixed wireline service, and the rest either expect to within the year (33%), or do so as the next generation (I2) service is developed (17%.) And 75% of those who offer a residential retail VoIP replacement phone service are also collecting and remitting state and local 9-1-1 fees for VoIP customers, while 25% indicate they will as they get essential trunk and database access.

NENA/VON Coalition 9-1-1 VoIP Agreement:
NENA and the companies have agreed upon the following action items:

> **Ensure 9-1-1 Calls Reach Emergency Responders (I1).** For service to customers using phones that have the functionality and appearance of conventional telephones, 9-1-1 emergency access will be provided (at least routing to a Public Safety Access Point (PSAP) 10-digit number) within a suitable time (three to six months), and prior to that time inform customers of the lack of such access.

> **Work Directly With PSAPs in a Region.** When a communications provider begins serving a particular area it should discuss with the local PSAPs or their coordinator the approach to providing service. This obligation does not apply to any "roaming" by customers.

> **Work Towards 9-1-1 Solutions Using Existing 9-1-1 network (I2).** Support for NENA and industry work towards an interim solution that includes (a) delivery of 9-1-1 calls over the 9-1-1 network, (b) providing callback number to the PSAP, and (c) in some cases, initial location information.

> **Support Advanced Future 9-1-1 Solutions and IP-Enabled PSAPs (I3).** Support for current NENA and industry work towards long-term solutions that include (a) delivery of 9-1-1 calls to the PSAP, (b) providing callback number/recontact information to the PSAP, (c) providing location, and (d) PSAPs having direct IP connectivity.

> **Support 9-1-1 Funding.** Support for an administrative approach to maintaining funding and resources at a level equivalent to those generated by current or evolving funding processes.

> **Educate Consumers About VoIP 9-1-1 Capabilities.** Development of consumer education project involving various industry participants and NENA public education committee members, with suggested materials so that consumers are fully aware of 9-1-1 capabilities and issues.

To more fully understand the standards and technologies necessary to ensure the future, it is best to start from the standpoint of the traditional 9-1-1 call.

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[1] See NENA's wireless 9-1-1 overview at http://www.nena.org/wireless9-1-1/overview.htm It took 16 years from the time cell phones were first introduced until October 1, 2001 when wireless providers were first required to begin making E9-1-1 capable service available including selective routing ANI and ALI. Wireless E9-1-1's FCC Deadline is December 31, 2005. http://www.fcc.gov/9-1-1/enhanced/ At the same time, not all PSAPs are yet capable of handling the information. By contrast, some VoIP providers are already entering the market with ALI capable E-9-1-1 services within the first year of offering services. See Appendix A for a description of the capabilities that VoIP leaders are offering

There are four main elements of a traditional 9-1-1 call.

- **Routing Emergency Calls to the Right Call Center.**
  A traditional 9-1-1 call from a regular phone is automatically routed by the telephone company through a "selective router switch" to the appropriate public safety answering point (PSAP), where a calltaker handles the call and ensures the appropriate police, fire, or emergency medical service response.

- **Including a Valid Call-Back Number**
  The 9-1-1 calltaker must be able to reach the emergency caller if the original call is disconnected. Traditional wireline emergency calls include a callback number for this purpose. In this case, the calltaker's console displays the automatic number identification (ANI), which provides call back information for the caller. The ANI is different from the caller ID because it comes directly from the telephone company's switching equipment.

- **Location Plays a Central Role in Emergency Calls**
  Caller location plays a central role in routing emergency calls. For practical reasons, each emergency answering center generally handles calls only for a certain geographic region. When a call is delivered to the PSAP, the ANI is used to query a database that provides the associated physical location for the caller using Automatic Location Identification (ALI).

- **Address Verification.**
  In order to ensure that an address is valid prior to an actual emergency call, the Master Street Address Guide (MSAG) records all valid ranges of addresses for each street. The MSAG also assigns the code to the primary PSAP for routing.

VoIP innovations can confound the legacy 9-1-1 architecture because VoIP users can:
> Select the area code of their choice not tied to geographic location
> Use an Internet phone anywhere a broadband connection is available
> Use devices or services that can make a phone call but may not have a phone number themselves
> Connect over a variety of technologies including DSL, cable modem, wireless or satellite broadband technologies
> Use their VoIP service nomadically, connecting their VoIP phone at multiple and geographically varied physical locations

Additionally, VoIP is a name for a type of technology that can be used in many ways and for services in both the residential and enterprise sectors that are not comparable to traditional voice communications for which customers expect to have the ability to call 911. Forms of VoIP are now being integrated into a variety of web, instant messenger, gaming and other applications. Legacy 911 requirements should not be imposed on all present and future VoIP services without some consideration, since many of them may have neither need nor expectation of dialing 911.

At the same time the existing 9-1-1 system, designed 40 years ago, is a challenging environment for new technologies like VoIP because it is outdated when it comes to new technologies. VoIP services and other new technologies are constrained in their ability to provide 9-1-1/E9-1-1 services due to the limitation of the infrastructure itself.

For example, some emergency systems are still using a 1970s technology, known as CAMA trunks, which induces call setup delays and limits the amount of information that can be transferred to the caller's 10 digits.

However to interface with today's systems, VoIP providers need interconnection to incumbent utility E9-1-1 selective router switches, the Master Street Address Guide (MSAG) and Automatic Location Identification (ALI) database uploads. Today, <u>direct</u> interconnection into the 9-1-1 system is typically only available to entities that provide "telecommunications services", not VoIP providers who offer "information services." Therefore, VoIP providers who want to provide 9-1-1 services to their customers and who cannot directly interconnect to the 9-1-1 network, must instead find a third-party telecommunications provider who is legally able to connect to the network in order to provide E9-1-1 capability.

Even when VoIP services companies can interface with the 9-1-1 network, providing enhanced 9-1-1 features is not always easy. Continued investment and vigilance is necessary and change takes time.

VoIP services promise to greatly enhance the delivery of emergency services, but the requisite upgrades to the 9-1-1/E9-1-1 infrastructure will require the efforts of many different industry participants.

The public may not always be able to differentiate between a retail VoIP telephone call and a traditional land line telephone call. To meet their expectations, the NENA-VON Coalition Six-Point Agreement establishes the framework on how to work together to get these callers who would have an expectation of being able to reach 9-1-1 into the 9-1-1 system – in three stages.

The three stages identified for VoIP/9-1-1 solution development include:

- **Ensuring VoIP 9-1-1 Calls Reach Emergency Responders.** The first stage, known as the "I1 solution stage", routes a residential or retail VoIP 9-1-1 type call to the local PSAP via the public switched telephone, cable or CLEC network to a PSAP designated 10-digit emergency phone number for the PSAP. When using this solution, service providers verify the delivery method, and if using a 10 digit number, ensure that the proper number is identified in coordination with the PSAP or PSAP coordinator. 100% of survey respondents are offering a 9-1-1 service that ensures that when a residential or retail customer dials 9-1-1, it gets routed to a designated PSAP – some using a 10-digit routing solution, others providing an E9-1-1 solution for fixed users, and some offering both. Among the types of solutions offered, 56% of survey respondents offer a 10-digit dialing solution which requires the VoIP caller, as with many wireless telephone callers, to provide the call-taker with location and call back information. This is comparable to the level of 9-1-1 service that most wireless callers had through 1998. But VoIP providers are committed to doing more. Likewise for fixed users, 60% of survey respondents who provide a VoIP replacement residential phone service indicate they offer E9-1-1 access today with automatic call back number and location information to emergency call centers like traditional fixed wireline service.
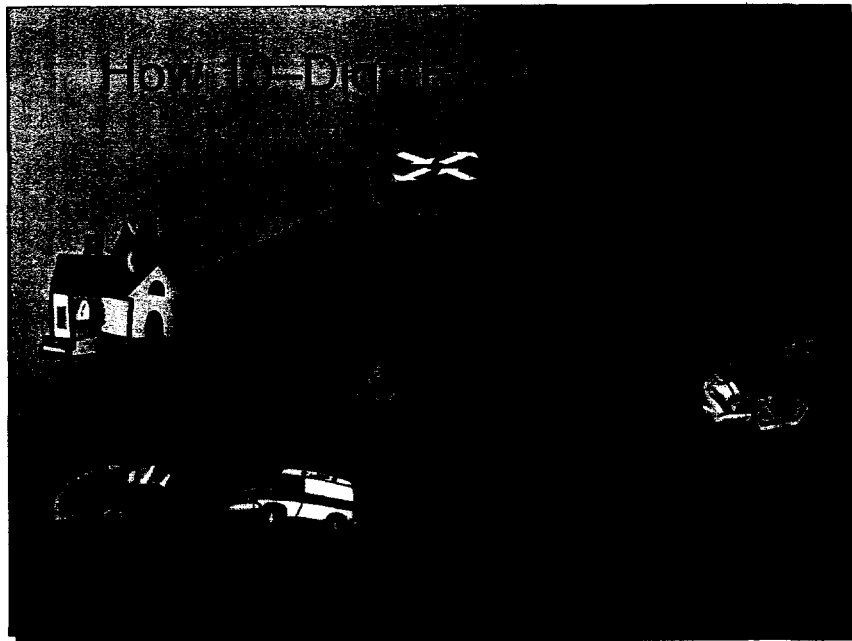
- **Enabling Full VoIP Enhanced 9-1-1 Service.** This technological stage is known as the I2 solution stage which improves the functionality of the VoIP 9-1-1 service by providing access to the current E9-1-1 infrastructure and systems, telephone number information (ANI), selective routing to determine the correct PSAP, a dedicated 9-1-1 network, and location information (ALI). *Because the 9-1-1 call is routed as on the 9-1-1 network and is accompanied* by traditional E9-1-1 caller information, emergency personnel can ensure that residential or retail callers receive the same kind of response that they are accustomed to receiving from legacy, switched telecommunications services provided by incumbent telephone carriers. This requires development and deployment of location technology in order to serve nomadic users. **100%** of survey respondents will adopt the more advanced I2 9-1-1 solutions for

residential use within a year after standards and solutions are developed -- 63% immediately, and 38% within 6 to 12 months.

Even before the I2 solution is completed, VoIP providers are developing and delivering 9-1-1 solutions for _fixed_ location residential or retail VoIP services, which utilize the current 9-1-1 network call delivery system to provide both telephone number (ANI) and location (ALI) information to the call-taker. In fact, 60% of survey respondents are already providing this pre-I2 E9-1-1 solution, and the rest either expect to implement this type of service within the year (30%) or as the I2 solution is developed (10%.) This scenario uses selective routing to get the call to the appropriate PSAP based on the service address defining the fixed or nomadic location. It also provides the call back number and access to the PSAP via the dedicated 9-1-1 network.

- **Developing an IP Based Emergency Response System.** The I3 solution stage is the longer-term solution and will provide a truly "Enhanced" 9-1-1 for VoIP callers, with automatic telephone number (ANI) and location information (ALI) delivered to the 9-1-1 system via an IP network in real time. This type of technology prepares America for a host of advanced emergency technologies and applications. I3 finally gets emergency services ahead of the technology curve.

A Three Staged Approach to VoIP 9-1-1

	Attribute	Delivering 9-1-1 (I1)	Enhanced Analog 9-1-1 (I2)	Enhanced Digital 9-1-1 (I3)
Routing	Through 10 digit number	✓		
	Through existing 9-1-1 network	✓	✓	
	Through IP network			✓
Call-Back Number	Provided by user	✓		
	Automatically provided		✓	✓
Enhancements	Enables enhanced digital emergency services			✓

While VoIP 9-1-1 calls are reaching emergency services today, efforts are underway to develop even better next generation 9-1-1 services that provide full 9-1-1 functionality for nomadic VoIP services and enable a host of breakthrough improvements in emergency application technologies.

Enabling Full 9-1-1 Capabilities for Nomadic VoIP Users - Developing the I2 solution. Already, the NENA Migratory Team has reached consensus on the basic design of the I2 solution. I2 builds upon the traditional network components of a 9-1-1 network such as the Selective Router, the ALI database and dedicated trunking. It accommodates stationary and nomadic VoIP users with the implementation of Location Information Servers. With traditional E-9-1-1 service, a caller's location information is retrieved from the ALI Database. However, with nomadic VoIP service, the street address is not available in the ALI Database. The NENA Migratory Team has agreed that I2 solutions will either add Location Information Server functions to the network, or alternately provide a geodetic location address to validate the location of the customer and forward legitimate ALI for a nomadic user. There is still more work to be done to make I2 a reality. The NENA Migratory Team must still cross-validate to ensure that all appropriate features of E9-1-1 are supported by the design, and must make adjustments where necessary. In addition, the NENA Technical Lead group has to validate that all design needs are being met, to cross-validate the Working Group and VoIP/Packet Technical Committee analysis. These activities could be completed as soon as the second quarter of 2005. Implementation will follow in 2005 and/or early 2006.

Making Progress On The Next Generation Digital Emergency Network – the I3 solution. Even though I2 specifications have not yet been completed, another team has started the dialogue on the Long Term Industry Solution or I3. The goal of I3 is being articulated as "totally IP" – an IP based E9-1-1 system. With this solution, E9-1-1 features and functions will be provided using IP protocols and logic. It will encompass dynamic location records, the ability to handle nomadic and mobile customers and interoperability between PSAPs.

A number of NENA task forces are working on various aspects of funding to cover the costs of the migration from I2 to I3 and to maintain the I3 architecture once it is implemented. Some of the issues being discussed are:

- A change of the Regulatory paradigm
- A change of roles & responsibilities stemming from a state/locally funded 911 plan to a nationwide solution
- Establishing the new IP enabled PSAP
- Upgrading to the new IP-based infrastructure
- Affordability of the current day-to-day operation

The Network Reliability Interconnect Forum (NRIC) has also focused their 2005 work on accommodation of Homeland Security situations given IP technology and the nomadic nature of the population.
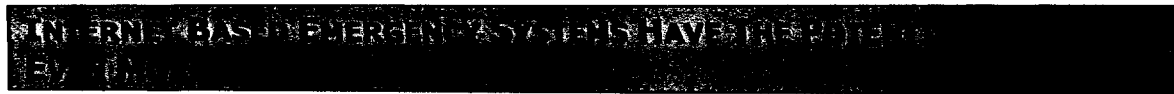
Traditional emergency services have generally been summoned by voice calls only. The nation's more than 6,000 emergency call centers are missing out on a technological breakthrough that could be on par with the invention of police car radios or 9-1-1 itself. By migrating to an IP enabled emergency service system, we can bring the same kind of innovations to the emergency network that IP has brought to voice.

Unfortunately today's systems too often use outdated technologies like CAMA trunks, an analog technology developed decades ago, which is used to simultaneously carry voice and data to the PSAP. But the data being carried is limited to the caller's 10-digit phone number, which is used to pull other information from a database.

By upgrading to Internet Protocol (IP) based equipment, 9-1-1 calls could be accompanied by much more information, such as a callers" medical records, medical status, language preference, or maps of commercial buildings. With today's system, there is no way for end users to automatically inform emergency technicians that someone has Alzheimer's, or for a PSAP to receive photo or video images. In the future, VoIP 9-1-1 calls may be able to support not only voice but a variety of data and video features/functions. With millions of camera phones in consumer's hands today, pictures from crime scenes and or accidents could be provided with the 9-1-1 call. An Internet enabled PSAP might be able to take advantage of additional media during an emergency call -- both to support callers with disabilities and to provide additional information to the call taker and caller. For example, video from the caller to the PSAP may allow the call taker to better assess the emergency situation; a video session from the emergency responder to the emergency caller may provide instructions for first aid. Moreover, an IP-enabled E9-1-1 system will be better equipped to handle multimedia information and better respond to people with disabilities who may rely upon text- or video-enabled signing to communicate in an emergency.

An IP enabled PSAP could also eventually be able to relocate in an emergency, solicit additional staff "to the console," and enable them to work "virtually" to accommodate a peaked situation. An IP-based call center solution could enable multiple PSAPs to function as one, facilitating load balancing and disaster recovery back up.

Ultimately, reconfiguring the way 9-1-1 calls are processed and delivered will allow any person, with any communication device, using any type of protocol, to be connected to an emergency response center responsible for dispatching emergency services in the users immediate location. This will result in a vibrant, growing 9-1-1 system that extends and retains its critical relevance and centrality.

In addition, this transition to IP networks will eventually allow Public Safety Answering Points (PSAPs) to lower costs and to move more quickly in the event of an emergency.[2] IP offers the opportunity to increase robustness and decrease costs of 9-1-1 network components – if we do it right.

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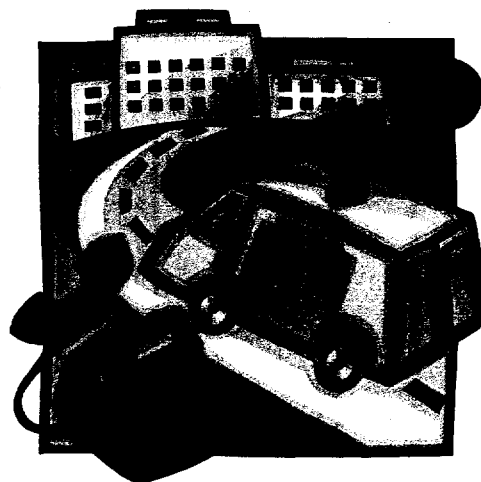
[2] *Testimony of Professor Henning Schulzrinne, Department of Computer Science, Columbia University at FCC's Internet Policy Working Group E9-1-1 Solutions Summit* (March 18, 2004) (available at: http://www.fcc.gov/ipwg/E9-1-1SummitHenning.pps).

Disaster recovery processes at a PSAP could be simplified. The reduction in traditional TDMA circuits could reduce monthly recurring costs and the IP enabled PSAP would be in a position to meet the 9-1-1 needs for years to come.

But VoIP offers emergency advances beyond the ability to dial 9-1-1. For example, the Department of Commerce has combined its voice system with an emergency broadcast system, creating an emergency alert system whereby users are contacted in the case of an emergency.[3] Likewise, Herndon, Virginia is using a VoIP system that automatically displays a picture of a missing child and possible suspects to VoIP phones equipped with special screens used by municipal workers.[4]

Ultimately, rather than continuing to develop more ad-hoc, patchwork, short-term solutions to force new technologies to work within an aging 9-1-1 infrastructure, the far better alternative is to transform today's 9-1-1 technology with new, innovative, and more flexible solutions for public safety that meet current needs with appropriate long-term solutions, and provides a robust platform upon which to build solutions to future challenges.

Ensuring sustained funding for 9-1-1 services is a vital part of the equation. Signatories to the VON/NENA agreement support an administrative approach to maintaining funding of 9-1-1 resources at a level equivalent to those generated by current or evolving funding processes. Although it is unclear whether VoIP providers have full access to same databases and network facilities as do traditional phone companies, they are stepping up to the plate with a commitment to pay into the system. For example of agreement signators, 75% of those providers offering a residential retail product already collect and remit state and local 9-1-1 fees for VoIP customers, while the rest say they will do so as they gain access to essential 9-1-1 switches and databases.

Today's 9-1-1 network is funded locally by a surcharge on each telephone line. Some have worried that if every American gave up their traditional wireline phone today, the 9-1-1 system would be underfunded. These concerns might be noteworthy, but the fact is that such numbers will remain low while VoIP technology is in the early stages of deployment. While Internet enabled communications services offer great promise, they are still in the early stages of development and the number of VoIP residential lines is very small. With approximately 600,000 users at the end of 2004 and 1.5 million by the end of 2005[5], the number of VoIP residential lines represents only a tiny fraction of the 113

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[3] William Jackson, "*With VoIP, Digital Department Comes of Age at Commerce*" (available at: https://secure.cio.noaa.gov/hpcc/docita/files/with_voip_digital_department_comes_of_age_at_commerce_0 9162003.pdf).

[4] *Net Phones Start Ringing Up Customers*, Business Week, December 29, 2003, at 45.

[5] New York Times, August 24, 2004 at http://www.nytimes.com/2004/08/24/business/24cisco.html?th

million households where the traditional phone line still remains the primary line. Given this comparatively small adoption rate, the expectation is that the volume of VoIP 9-1-1 will not surpass two percent of all 9-1-1 calls in the next three years[6], and the fact that VoIP providers are already paying into the system, VoIP is not undermining, but in fact supporting current 9-1-1 services.

Over the long-run, developing and implementing the I-3 solution and transforming the traditional PSAPs into IP enabled PSAPs is likely to require a new forward-thinking funding model and national commitment. The National 9-1-1 Program Office, in enacting the ENHANCE 911 Act of 2004, can play a vital role in the deployment of IP enabled solutions for 9-1-1.

VOIP is perhaps the most significant advancement in communications since the arrival of e-mail. The potential for a vast new wave of VoIP-led technological innovation is here. However in order to unlock these vast new benefits, policymakers, innovators, and emergency service providers need to help overcome a set of emerging policy challenges and nurture future innovation.

The VON Coalition joined with NENA to bring together the nation's leading VoIP providers to forge a voluntary agreement to develop the technical and operational mechanisms for providing effective access to emergency services by residential end users of VoIP. The VON/NENA effort is not only proactively supporting solutions that ensures that when 9-1-1 is dialed the call will be routed for emergency response, but also that enable even more robust solutions than today's legacy wireline 9-1-1 system can provide.

To advance these solutions, progress is being made on all six areas of the agreement. In fact, industry is already stepping into the marketplace with E9-1-1 solutions that are more technologically sophisticated than were available at the time the agreement was developed. With additional development, VoIP 9-1-1 services promise to be far superior to the services offered to wireline customers today.

And while VoIP helps raise important new policy questions, the most pressing question policymakers need to address today is how we ensure that Americans can take full advantage of the promise and potential of VoIP. With effective emergency services in hand, VoIP promises to make talking more affordable, businesses more productive, jobs more plentiful, the Internet more valuable, and Americans more safe and secure.

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[6] Intrado estimate of VoIP 9-1-1 calls as a fraction of all 9-1-1 calls.

About the VON Coalition:
The Voice on the Net or VON Coalition consists of leading VoIP companies, on the cutting edge of developing and delivering voice innovations over Internet. The coalition, which includes AT&T, BMX, BT Americas, CallSmart, Convedia, Covad, IceNet, iBasis, Intel, Intrado, Level 3, MCI, Microsoft, PointOne, Pulver.com, Skype, TeleGlobe, Texas Instruments, USA Datanet, VocalData, and Voiceglo, believes that Americans are fundamentally better off with a generally hands off regulatory approach to Internet and Internet based services like VoIP. Since its inception, the VON Coalition has consistently advocated that federal and state regulators maintain current policies of refraining from extending legacy regulations to Internet services, including VoIP. More information about the VON Coalition can be obtained at the following website: http://www.von.org

About NENA:
The National Emergency Number Association (NENA)'s mission is to foster the technological advancement, availability, and implementation of a universal emergency telephone number system. In carrying out its mission, NENA promotes research, planning, training and education. The protection of human life, the preservation of property and the maintenance of general community security are among NENA's objectives. More information about NENA can be obtained at the following website: http://www.nena.org/

In the wake of the VON NENA agreement, companies are stepping forward to provide emergency services today.

8x8 Providing E9-1-1 VoIP Service. On June 14th 2004, 8x8 announced the immediate availability of enhanced 9-1-1 (E9-1-1) services for subscribers to their Packet8 VoIP service. Their service automatically routes 9-1-1 calls and provides caller location data into the current E9-1-1 system which then delivers those calls and data to PSAPS. Because the 9-1-1 call is routed as emergency traffic and is accompanied by E9-1-1 caller information, emergency personnel can ensure that callers receive the same kind of response that they are accustomed to receiving from legacy, switched telecommunications services provided by incumbent telephone carriers.
http://www.packet8.net/about/e9-1-1.asp
http://www.8x8.com/news_events/releases/2004/pr061404b.asp.html

AT&T Consumer Services Providing Emergency Access for VoIP Service. On January 27th 2004, AT&T announced that it had added alternative emergency calling features to its residential broadband VoIP service so that it was immediately available to customers when it launched its AT&T CallVantage(sm) Service VoIP offering in the spring. It provides customers with the security of knowing that when they dial 9-1-1 from AT&T CallVantage Service, the call will be optimally routed for emergency response. AT&T has also said that it expects to offer AT&T CallVantage Service users E9-1-1where technically feasible.[7]
http://www.usa.att.com/callvantage/faqs/about_9-1-1.jsp
http://www.intrado.com/main/home/news/press/040127.jsp   www.att.com/voip

Intrado Providing Emergency Access For Other VoIP Providers. Intrado is providing an I1 solution that enables VoIP user's 9-1-1 calls to be routed to the correct PSAP using a PSAP determined ten-digit emergency number. Intrado's provisioning system takes care of geo-coding, storing and maintaining subscriber data for routing the calls accurately to the public safety system when 9-1-1 is dialed. Additionally, Intrado is currently contracting with VoIP providers for an I2 solution called V9-1-1 Mobility Service. This service will provide nationwide Enhanced 9-1-1 (E9-1-1) for VoIP while enabling key features like mobility and foreign telephone number (TN) assignment. VoIP 9-1-1 calls are routed within the existing 9-1-1 network, delivering Automatic Location Information (ALI) and Automatic Number Information (ANI), on dedicated 9-1-1 trunks to the appropriate Public Safety Answering Point (PSAP). More information available at
http://www.intrado.com/main/home/news/features/voip.jsp

Level3 Providing E9-1-1 for Residential VoIP. On March 16th, 2004, Level3 announced that it will meet 9-1-1 and E9-1-1 interconnection standards across the U.S. for residential VoIP services. For fixed VoIP lines, Level3 is providing a solution which utilizes databases to store customers' address and phone number information and to establish direct trunks into many of the 450 selective routers nationwide. Each of those selective routers feeds into multiple PSAPs, directing each 9-1-1 call to the appropriate PSAP and ensuring that address information is automatically correlated and available. http://www.level3.com/press/4446.html

MCI Providing E9-1-1 VoIP service. On August 8th, 2004 MCI announced that it is providing E9-1-1 capabilities by utilizing the existing 9-1-1 network to route calls to

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[7] AT&T says it expects to offer VOIP users E9-1-1 in six to nine months, as of August 2004. See:
http://www.lightreading.com/document.asp?site=lightreading&doc_id=57241

the appropriate Public Safety Answering Point (PSAP) for its MCI Advantage VoIP service. This allows the VoIP caller's location and phone number to be automatically displayed in front of the 9-1-1 call taker so emergency assistance can be dispatched to a location even if the caller cannot communicate. MCI also announced that it is remitting 9-1-1 service fees in accordance with local 9-1-1 requirements.
http://global.mci.com/ca/news/news2.xml?newsid=11390&mode=long&lang=en&width=530&root=/ca/&langlinks=off
http://global.mci.com/us/enterprise/internet/connection/faq/

Vonage Providing Emergency Calling for VoIP Service. On March 25, 2003, Vonage announced that emergency calls will be handled over its VoIP network creating a reliable solution that interfaces to the Public Switched Telephone Network (PSTN) as an interim step toward an ultimate VoIP E9-1-1 solution. This allows Vonage to offer subscribers the security of knowing that when they dial the digits 9-1-1 their calls will be delivered via the PSTN to the Public Safety Answering Point (PSAP) designated for their fixed subscription location. Vonage has said it expects to begin offering customers E9-1-1 service sometime in 2005. Vonage is not a VON Coalition member but a signator to the VON NENA agreement.
http://www.vonage.com/features.php?feature=9-1-1
http://www.vonage.com/corporate/press_index.php?PR=2003_03_25_0

Useful Web Resources:

National Emergency Number Association (NENA)	http://www.nena.org/
The Voice on the Net (VON) Coalition	http://www.von.org/
Federal Communication Commission (FCC) VoIP page	http://www.fcc.gov/voip/
Alliance for Telecommunications Industry Solutions (ATIS)	http://www.atis.org/
NENA VoIP/Packet Committee	http://www.nena.org/9-1-1TechStandards/voip.htm
Internet Engineering Task Force (IETF)	http://www.ietf.org/
Prof. Henning Schulzrinne, Columbia University Presentation	http://www.cs.columbia.edu/~hgs/papers/2002/9-1-1.ppt
Presentation during 2004 NENA conference	http://www.dispatchmonthly.com/nena2004_voip.ppt
Network Reliability and Interoperability Council (NRIC)	http://www.nric.org/
E9-1-1 Institute	http://www.e9-1-1institute.org/index.html

THE VON COALITION/NENA STATUS REPORT ON 9-1-1

National Emergency Number Association (NENA) and VoIP leaders are making progress on providing access to emergency service for VoIP users while creating a sound financial and political infrastructure. In less than a year, since the agreement was reached last December, progress has been made in all areas. In fact, almost every major residential and non-Enterprise VoIP provider, in the market today, is providing a service such that VoIP customers dialing 9-1-1 do reach emergency services. To that end, we would like to share progress to date and clarity on the 6 action items.

Survey results are based on the survey responses from 8 of the 10 VoIP providers who signed the initial VON NENA agreement and who are providing a VoIP replacement phone service.

NENA and the companies have agreed upon the following action items:

1. **Ensure 9-1-1 Calls Can Reach PSAPs (I1).** For service to customers using phones that have the functionality and appearance of conventional telephones, 9-1-1 emergency services access will be provided (at least routing to a Public Safety Access Point (PSAP) 10-digit number) within a reasonable time (three to six months), and prior to that time inform customers of the lack of such access.

    Progress:
    ✓ *100% of respondents are offering a 9-1-1 service that ensures that when a residential retail customer dials 9-1-1, it gets routed to a designated PSAP.*
    ✓ *Ahead of expectations, 50% are already going beyond the initial 10 digit solution and are providing automatic call back number and location information to emergency call centers like traditional fixed wireline emergency service.*
    Clarity: *Neither NENA or the VON Coalition recommended or required 10 digit number delivery methods. The words 'at least routing to a PSAP 10 digit number' were meant to indicate the minimum method, not the specific method.*

2. **Work Directly With PSAPs in a Region.** When a communications provider begins selling in a particular area, it should discuss with the local PSAPs or their coordinator the approach to providing access. This obligation does not apply to any "roaming" by customers.

    Progress:
    ✓ *80% inform PSAPS about their approach to 9-1-1 service when they enter a market.*

3. **Work Towards 9-1-1 Solutions Using Existing 9-1-1 network .** Support for current NENA and industry work towards an interim solution for residential or non-enterprise end users that includes (a) delivery of 9-1-1 call through the existing 9-1-1 network, (b) providing callback number to the PSAP, and (c) in some cases, initial location information.

    Progress: Progress on this issue has surpassed what was possible when the agreement was signed to accommodate nomadic and fixed customers with an emergency solution that uses the 9-1-1 system to provide callback and location information. Ahead of what was possible last December, several companies are

in the market today having implemented such a solution for fixed end users where technically feasible.

To make further progress on the I2 solution, the NENA Migratory Team has also reached consensus on a proposed solution which they are in the midst of documenting. The I2 solution will delivery 9-1-1 calls on 9-1-1 groups via the Selective Router, and provide a call back number and an ALI record. This solution will also work for nomadic users and allows information to be "pushed" to the 9-1-1 systems in real time.

✓ *100% support efforts to reach an I2 solution which would automatically provide callback number and location information for both fixed and nomadic users through the existing 9-1-1 network.*

✓ *100% will adopt the more advanced I2 9-1-1 solutions within a year after standards and solutions are developed -- 60% immediately, and 40% within 6 to 12 months.*

4. **Support Advanced Future 9-1-1 Solutions and IP-Enabled PSAPs (I3).** Support for current NENA and industry work towards long-term IP-based solutions that include (a) delivery of 9-1-1 calls to the proper PSAP, (b) providing callback number/recontact information to the PSAP, (c) providing location of caller; and (d) PSAPs having direct IP connectivity.

Progress: The I3 work is well underway, includes the above features and support for all current E9-1-1 features and functions, with improvements where available, in a fully IP-based 'virtual E9-1-1' system design. Completion of requirements is scheduled for early 2005.

✓ *100% support current NENA and industry work towards long-term I3 solution which would automatically provide callback number and location information for fixed, nomadic and portable users over an IP network.*

✓ *100% believe that when fully implemented, IP based 9-1-1 solutions can be more robust than the solutions provided by today's network and can provide more advanced emergency solutions that can make our country even safer*

5. **Support 9-1-1 Funding.** Support for an administrative approach to maintaining funding of 9-1-1 resources at a level equivalent to those generated by current or evolving funding processes.

Progress: Now that the I2 solution has been defined, the VON Coalition will help to scope out the components of funding the 9-1-1 Infrastructure for VoIP users; acknowledging that a new paradigm needs to be adopted in order to sustain the I2 solution and migration to I3.

In the interim, we must reinforce the fact that VoIP providers do intend to continue to support, collect and remit residential retail 9-1-1 surcharges until alternative arrangements are made. The goal is to continue to insure the 9-1-1 Infrastructure/PSAPs are equivalently funded. At the very least, we need to overcome the perception that 9-1-1 funds will be lessened as a result of VoIP funds. Further status should be available in 2nd quarter of 2005.

We further support the development of that National 9-1-1 Program Office as established by the ENHANCE Act of 2004.

✓ *75% of retail providers already collect and remit state and local 9-1-1 fees for VoIP customers.*

6. **Educate Consumers About VoIP 9-1-1 Capabilities.** Development of consumer education projects involving various industry participants and NENA public education committee members to create suggested materials so that consumers are fully aware of 9-1-1 capabilities and issues.

> *Progress: The Public Education Subcommittee of NENA has created preliminary documentation for VoIP users in an attempt to supplement the terms and conditions of each carrier. The committee has also expanded it's audience to include the PSAP as their role is greatly challenged in this new environment. In addition, all VON Service Providers have done due diligence to their terms and conditions statements to proactively make the residential or retail customer aware of the difference between traditional E9-1-1 and the temporary 10-digit solution.*
> ✓ *100% inform customers about the level of 9-1-1 service provided.*
>
> *The Coalition has also developed this white paper to help inform policy makers, press, regulators and others.*

<p style="text-align:center">* * *</p>

In December of 2003, the Voice on the Net (VON) Coalition, the leading voice on VoIP policy issues, and the National Emergency Number Association (NENA), the leading emergency services organization, came together to forge a landmark agreement to find workable 9-1-1 solutions for VoIP. In December 2004, the VON Coalition released these results of a survey of leading VoIP providers who signed the initial VON-NENA agreement and other VON coalition members to gauge the current state of progress towards providing emergency service for VoIP users.

TYPE OF 9-1-1 SERVICE BEING OFFERED

Sixty percent of broadband VoIP service providers surveyed are currently offering a VoIP service that provides E9-1-1 access today for fixed users with automatic call back number and location information to emergency call centers like traditional fixed wireline service. The remainder either expect to implement E9-1-1 service within a year or are expecting to roll out E9-1-1 service as the next generation of service (I2) is developed.
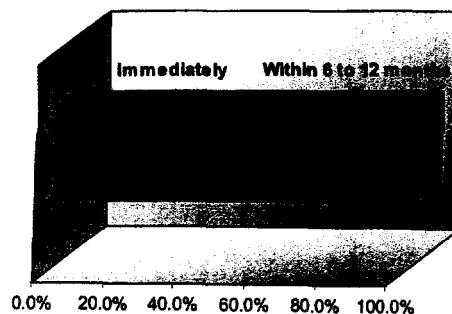
60% DELIVERING TRUE E9-1-1 TODAY
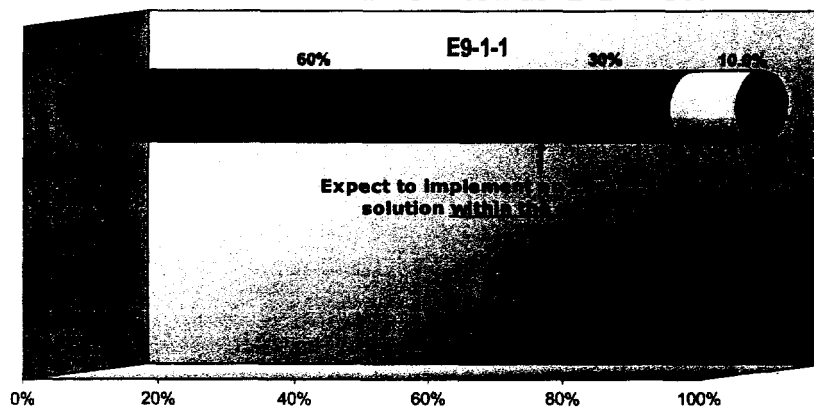
9-1-1 A STANDARD FEATURE FOR MOST

63% provide 9-1-1 as a standard feature with their service (50% for fixed users, 13% for fixed and nomadic users.)
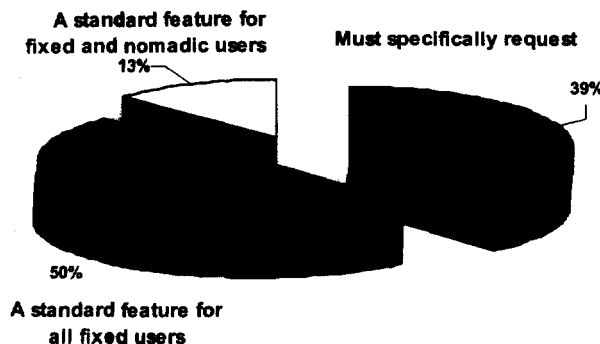
ADOPTING ADVANCED SOLUTIONS

100% will adopt new more advanced 9-1-1 solutions (I2) within a year after standards and solutions are developed -- 63% immediately, and 38% within 6 to 12 months.

SUMMARY OF KEY FINDINGS

Results are based on the survey responses from 14 leading VoIP providers who either signed the initial VON NENA agreement or are VON Coalition members and who are providing a VoIP replacement phone service for residential customers.

✓ 100% of respondents are offering a 9-1-1 service that ensures that when a customer dials 9-1-1, it will get routed to a designated PSAP.

✓ 60% are currently offering a VoIP service that provides E9-1-1 access today with automatic call back number and location information to emergency call centers like traditional fixed wireline service -- with the remainder expecting to either implement this type service within a year (30%), or roll out new services as the next generation (I2) service is developed (10%.)

✓ 56% provide the capability to route calls to the 10 digit number for the PSAP (Note: Several companies provide both a 10 digit solution for nomadic users, and an E-911 service for fixed users).

✓ 63% provide 9-1-1 as a standard feature with their service (50% for fixed users, 13% for fixed and nomadic users.)

✓ Of agreement signators, 75% of retail providers already collect and remit state and local 9-1-1 fees for VoIP customers, while 25% indicate they will when/if they are provided access to incumbent trunking and other databases.

✓ 100% will adopt new more advanced 9-1-1 solutions (I2) within a year after standards and solutions are developed -- 63% immediately, and 38% within 6 to 12 months.

✓ 100% inform customers about the level of 9-1-1 service provided, and 75% also inform the emergency response centers (either directly or indirectly) about their approach to 9-1-1 service.

✓ More than a thousand user 9-1-1 calls have been successfully delivered to emergency personnel since December 1st 2003 when the agreement was signed.

✓ 100% believe that when fully implemented, IP based 9-1-1 solutions can be more robust than the solutions provided by today's network and can provide more advanced emergency solutions that can make our country even safer.

KEEP INTERNET APPLICATIONS FREE FROM ACCESS CHARGES

Level 3 Petition for Forbearance from Access Charges
For IP-PSTN and Incidental PSTN-PSTN IP-Enabled Services
FCC WCB Docket No. 03-266

Since access charges were created in the early 1980s, the FCC has consistently kept Internet connectivity to the PSTN and Internet applications free of state and federal access charges. The FCC most recently reaffirmed this deregulatory approach to the Internet in 1997.

As a result, the Internet and IP applications have continued to develop, transforming everyday life at work and at home, in commerce and entertainment, keeping Americans connected in new ways. IP networks power the growth of businesses that no longer have physical offices, enable telecommuting arrangements, and allow far-flung families to share pictures, stories and memories as if they were just down the street.

By March 22, 2005, the FCC must decide whether to keep the Internet and IP applications free from access charges, continuing its pro-growth, pro-consumer approach to new technologies, or whether to change course, and threaten to subject the dynamic and innovative Internet world to a crumbling, legacy access charge system, even while the FCC is trying to reform the old system.

In a petition filed in December 2003, Level 3 Communications asked the FCC to confirm that IP-enabled applications that either originate or terminate on an IP network, and incidental communications, remain outside the scope of the 1980s-era access charge regime, and to forbear from any FCC rules that could even arguable be construed to the contrary. By statute, the FCC must decide, by March 22, 2005 whether to –

- Grant the *Level 3 Forbearance Petition*, and, on an interim basis pending the FCC's completion of comprehensive intercarrier compensation reform, confirm that traffic between a consumer on the traditional public switched network and a consumer on an IP network is exchanged (and compensated) under the 1996 Act's reciprocal compensation mechanism, rather than under the pre-1996 access charge regimes. This is the *de facto* status quo. This ruling would not apply in areas other than those served by small, rural carriers that are exempt from the 1996 Act's local telephone market-opening obligations.
- Threaten to impose an access charge system that is widely acknowledged to need substantial overhaul on IP-based applications for which the access charge system was not designed and will not work.

The benefits of granting the *Level 3 Petition* and keeping the Internet and IP applications free of legacy access charges:
- Consumers benefit from the tremendous innovation in IP-enabled services that has occurred while access charges have not applied. "All-you-can-eat" residential calling packages are now offered for as little as $19.95 per month, about a third the price at which such services were offered just a year ago.
- Innovative IP-enabled applications, including voice applications, drive broadband adoption. VoIP is broadband's first "killer app" for the mass market.
- The personalization of service that IP makes possible will itself create economic growth as individuals and businesses take advantage of IP's inherent flexibility and capabilities.
- Emergency services such as 911 can be delivered more effectively, and in a more personalized manner, using IP capabilities.
- IP networks and service providers will still compensate PSTN network providers whenever those networks are used to terminate a communication originating on an IP network.

If you want something to grow, don't tax it, or subject it to unnecessary legacy fees. Applying access charges to VoIP suppresses consumer benefits and economic growth in order to prop up a legacy regulatory regime that everybody agrees needs to be fixed. The best approach during the interim – the approach that preserves the economic growth and consumer benefits from IP networks – while the FCC completes intercarrier compensation reform is to leave the Internet and IP applications free of access charges.

Voice on the Net (VON) Coalition Principles

The longstanding U.S. policy of "hands off the Internet," has been emulated by governments everywhere and has been an enormous success. VoIP is a force for increased competition, a platform for innovation, and a driver of broadband deployment.

The best public policy is to refrain from applying traditional telecom regulation to VoIP and to affirmatively create a national policy vision that ensures that traditional telecom regulation does not apply to Internet voice communications throughout the country.

While members of this coalition have different views on how much market power some facilities-based telecom providers have, we all agree that policies should be continued that permit entities that do not have significant market power to deploy voice over IP free from traditional telecom regulation.

The Coalition freely concedes that there are important social policy issues where the FCC and state regulators have a legitimate role. The VoIP community is prepared to work constructively on such issues, including providing access to those with disabilities, access to emergency services, cooperation with law enforcement, secure funding for universal service, and reform of inter-carrier compensation. These legitimate concerns can be addressed without imposing heavy regulation on VoIP and that if they are addressed successfully the pressure to regulate VoIP will dissipate. The coalition supports efforts to address these issues including:

- **Emergency Services.** VoIP industry representatives have been working with the National Emergency Number Association's ("NENA's") VoIP/Packet Technical Committee and VoIP Operations Committee to assess the current state of 911 provisioning in VoIP environments and to develop 911 solutions. There are important differences between the provision of 911 for traditional PSTN traffic and for VoIP, but there is every reason to expect that technical solutions exist to provide users with reliable access to public safety services. NENA and representatives of the VoIP industry recently reached a voluntary agreement on the next steps to develop the technical and operational mechanisms for providing effective access to emergency services by users of VoIP.

- **Law Enforcement.** Voluntary efforts also are underway with respect to compliance with CALEA, the statute that addresses cooperation with law enforcement. Packet-switched technology poses unique technical issues, but manufacturers and providers of VoIP are moving ahead to implement compliance capabilities into their systems. Moreover, CALEA has a different definition of telecommunications than the Communications Act, so there is no need to define VoIP as telecommunications for Communications Act purposes in order to mandate that VoIP manufacturers and service providers cooperate with law enforcement.

- **Universal Service.** As for universal service, of course, VoIP providers directly or indirectly already contribute to USF. The fact that more and more calls, including wireless and business calls made on modal access as well as some VoIP calls, don't contribute or contribute unevenly to USF should not be an excuse for regulation of all these modes. Instead, what is needed is reform of funding for explicit USF. We believe that a numbers-based contribution mechanism would better ensure the continued sustainability of USF than any attempt simply to include VoIP or other information services in the current revenue-based mechanism. If one of the goals of universal service is to provide affordable voice communications to rural America, then no technology offers more promise for providing more affordable communications, not only to rural America, but to all of America.

- **Inter-carrier compensation.** We urge the FCC to move away from a hodgepodge of implicit subsidies and towards a rational series of voluntary inter-carrier business arrangements with regulation required only when there is effective monopoly ownership of a bottleneck. "Bill and keep" may well turn out to be an effective arrangement as it has been in much of the IP world.

- **Phone-to-Phone VoIP Regulation.** One suggestion that has been made is that phone-to-phone Voice over IP be regulated while "other" VoIP is not. This would be a mistake even if it were possible and it is, in fact, impossible to define today what is a phone. It is phone-to-phone traffic which has funded and continues to fund the buildout of a worldwide network of interfaces between the PSTN and the Internet around the world. These interfaces are necessary so that VoIP phone and voice PBXes can connect with the TDM world and vice versa. It is the existence of these networks of traffic exchange points which are making possible the deployment of innovative new VoIP services because the users of these services have full connectivity to the TDM world – not just to other VoIP users.

- **State Role.** We also don't deny that there is a legitimate role for state governments, but that role has to be defined in a way that is consistent with the interstate nature of the Internet and the practical problems that would be caused by varying state regulation.

- **FCC Role.** We believe that the FCC has the legal authority to continue to keep its hands off the Internet and IP networks even when they are used for voice applications. Voice over IP should be classified as an information service and regulated only to the extent necessary pursuant to the Commission's Title I or ancillary jurisdiction.

VoIP providers shouldn't be regulated like phone companies with large market power. The historic reason for telephony regulation was the existence of monopoly providers and an infrastructure which made it nearly impossible to challenge such monopolies even in the rare case where it was legal to do so. In contrast, a provider of a VoIP service has no need to own or build the infrastructure on which the service is delivered and, since there are no historic or even nascent VoIP monopolies, there is simply no basis for regulation of any such provider that does not have significant market power.

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